EPA Region 1, New England

Superfund Program May 2005

Proposed Plan

The Cleanup Proposal At A Glance

After careful consideration of the impacts of contamination at the Solvents Recovery Service of New England, Inc, site (SRSNE), EPA proposes the following cleanup plan:

- Treat waste oils and solvents in the overburden aquifer beneath the Operations Area by heating them in place.
- Consolidate and cap contaminated soil and wetland soil.
- Capture and treat on site the contaminated groundwater in both the overburden and bedrock aquifers that exceeds federal drinking water standards. Monitor natural degradation of the plume outside the capture zone until groundwater cleanup levels are achieved.
- Monitor natural degradation of the waste oils and solvents in the bedrock aquifer.
- Implement restrictions on uses of the site property and the groundwater.
- Monitor groundwater and maintain the cap in the long term. Perform reviews at least every five years to ensure that the remedy remains protective of human health and the environment.

A more detailed description of the proposed cleanup plan begins on page 4.

Solvents Recovery Service of New England, Inc. Superfund Site Southington, CT

What do you think?

EPA is accepting public comment on this cleanup proposal from **June 9, 2005 through July 8, 2005.** You do not have to be a technical expert to comment. If you have a concern or preference regarding EPA's proposed cleanup plan, EPA wants to hear from you before making a final decision on how to protect your community.

Learn about EPA's Proposed Plan at a public information meeting that will include a presentation describing the cleanup plan, followed by a question and answer session.

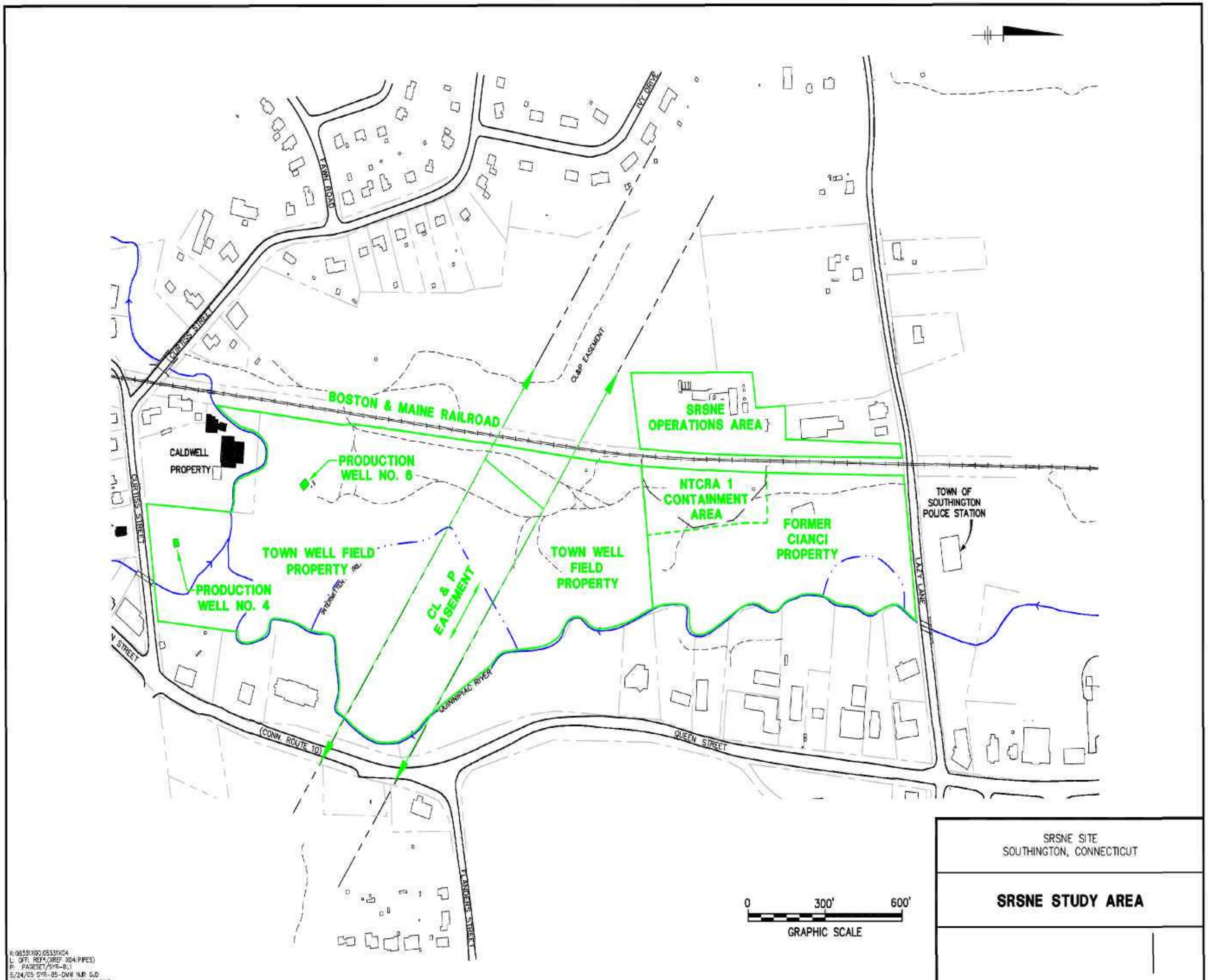
Wednesday, June 8, 2005 at 6:30 p.m.
Southington Public Library
255 Main Street
Southington, CT

A second meeting will be held on June 30 to provide an opportunity for citizens and local officials to offer oral or written comments at a formal public hearing.

Thursday, June 30, 2005 at 6:30 p.m.
Southington Town Hall - Council Chamber
75 Main Street
Southington, CT

If you are unable to attend the public hearing, you may also submit written comments - see page 23 to find out how. For further information about these meetings, call Jim Murphy of EPA's Community Affairs office at (617) 918-1028, or toll-free at 1-888-372-7341.

Figure 1


BOSTON & MAINE RAILROAD
SRSNE OPERATIONS AREA
CALDWELL PROPERTY
PRODUCTION WELL NO. 6
NTCRA 1 CONTAINMENT AREA
TOWN OF SOUTHINGTON POLICE STATION
FORMER CIANCI PROPERTY
TOWN WELL FIELD PROPERTY
TOWN WELL FIELD PROPERTY
PRODUCTION WELL NO. 4
CL & P EASEMENT
CL&P EASEMENT
QUINNIPIAC RIVER
INTERMITTENT TRIB.
CURTISS STREET
FAWN ROAD
IVY DRIVE
LAZY LANE
QUEEN STREET
(CONN. ROUTE 10)
FLANDERS STREET
0 300' 600'
GRAPHIC SCALE
SRSNE SITE
SOUTHINGTON, CONNECTICUT
SRSNE STUDY AREA

Overview of SRSNE Site History

1955: SRSNE begins operating the solvent recycling business on Lazy Lane.

1967: Two unlined lagoons used to store/dispose of sludge and still bottoms from the solvent distillation process are closed.

1974: The open burn pit, in which still bottoms, sludges and liquid wastes were destroyed, is decommissioned.

1976 & 1979: Town Well 4 and Well 6, respectively, are closed due to the presence of VOCs in the drinking water.

1983: SRSNE is added to EPA's Superfund List. A groundwater containment system is installed at SRSNE to intercept a plume of contamination that is migrating towards the Town Well Field.

1983 - 1988: State and federal enforcement actions taken to compel SRSNE to clean up the facility and operations. SRSNE fails to comply.

1989: EPA documents over 75 violations during an inspection, including poor housekeeping resulting in leaks and spills of hazardous waste to the bare ground.

1991: SRSNE is closed. Over 60 million gallons of spent solvents have been processed at the SRSNE facility.

1992: EPA removes soils contaminated with VOCs and PCBs from a drainage ditch along the eastern side of the Operations Area. Chemicals stored on site are also removed.

1995 - 2004: The PRP Group (businesses and individuals that sent waste material to SRSNE) installs and operates groundwater controls in the overburden and bedrock aquifers, completes remedial investigations, and conducts feasibility studies.

2004 - 2005: EPA evaluates cleanup options and prepares this proposed plan for public comment.

Why is Cleanup Needed?

The SRSNE Site is a highly-contaminated piece of property adjacent to both residential and commercial areas, upgradient of a municipal well field. The contaminants of most concern to EPA at this site are chlorinated and non-chlorinated volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), dioxin and metals. These are present in soil, and the overburden and bedrock aquifers at levels that are harmful to human health and the environment. The dissolved VOCs are at particularly high levels, at tens, hundreds, or in some cases thousands, of times their regulatory limits. Contaminated groundwater extends over approximately 30 acres. The volume of contaminated soil is approximately 18,000 cubic yards.

- Groundwater moving from the Operations Area towards the Quinnipiac River and Town Well Field is contaminated at levels that would threaten human health if it were to be used as a source of drinking water (Figure 1). The groundwater beneath the SRSNE site has been classified by the State of Connecticut as Class GA - the goal for which is to restore the groundwater to its natural quality.

- Waste solvents and oils that sit in the aquifer are a long-term source of contaminants that affect water quality. Soil in the Operations Area, along the railroad bed, and on the Cianci Property continue to leach contamination into the groundwater.

- The risk assessment evaluated potential human-health risk from exposure to soil based on the following pathways: incidental ingestion, dermal contact, and inhalation of fugitive dusts. Although EPA believes that the most likely future land use for the Site is recreational, cleanup requirements were based upon a residential scenario to satisfy CT DEP's requirements. Assuming a more protective future residential land use, an unacceptable risk was found in soil in the Operations Area. In addition, soil in the railroad bed and on the Cianci Property exceeded state regulatory requirements.

- The risk assessment evaluated potential human-health risk from exposure to groundwater based on potable use (i.e., drinking water) in the future. An unacceptable risk was found in both the bedrock and overburden groundwater mostly beneath the Operations Area.

- The risk assessment evaluated potential ecological risk from exposure to surface water, sediment and wetland soil and determined there was an unacceptable risk to plant and animal life from wetland soil at the culvert outfall on the Cianci Property.

Currently no one is using groundwater that exceeds safe drinking water standards. The site is fenced, so no one has access to soil that exceeds cleanup levels. However, actual or threatened releases of hazardous substances from this site, if not addressed by the proposed cleanup plan or other active measures considered, present future threats to public health, welfare and the environment.

Why Does EPA Recommend this Proposed Cleanup Plan?

EPA recommends this proposed cleanup plan because it is protective of human health and the environment, while at the same time being cost effective. EPA believes the proposed cleanup plan achieves the best balance among the criteria used to evaluate various alternatives. The cleanup being proposed provides both short-term and long-term protection of human health and the environment, attains all Federal and State applicable or relevant and appropriate environmental requirements (ARARs), reduces the toxicity, mobility and volume of contamination at the site, and utilizes permanent solutions to the maximum extent practicable by destroying contaminants in the subsurface in place, consolidating and capping contaminated soil and wetland soil on site, capturing and treating contaminated groundwater that exceeds cleanup levels, and monitoring the progress of natural degradation on contaminated groundwater outside the capture zone.

A Closer Look at EPA's Proposal

After careful study of the SRSNE Site, and weighing the pros and cons of different cleanup alternatives, EPA proposes the following plan to reduce risks associated with soil, wetland soil and groundwater contamination.

- **In-situ Thermal Treatment of the Overburden Aquifer (Alternative ONOGU-5)**

  An estimated 120,000 gallons of waste oils and solvents ("non-aqueous phase liquid" or NAPL) that sits in gravel, sand and silt deposits in the overburden aquifer in the Operations Area will be treated by heating the subsurface to temperatures around 100°F with electrodes and/or thermal wells. Heat has the affect of turning the liquid into a vapor phase for recovery, or it may destroy a portion of the contamination in place. A vapor extraction system, which will likely include a temporary cap, draws the contamination to the surface, where it is collected and treated on site. Treatment residuals and any liquid NAPL that is collected will be drummed and disposed of at an off-site commercial treatment facility. A network of above-ground piping and/or electrical distribution lines will connect the wells/electrodes.

  Well installation, operation and decommissioning is expected to take 9 to 12 months. The performance standard proposed for thermal treatment is to reduce VOC concentrations to levels that are not indicative of the presence of pooled or residual NAPL. We expect that this will reduce VOC mass in the ground in the Operations Area by 95 to 99%. The NAPL that remains after treatment, as well as any NAPL that exists beyond the treatment zone, will continue to impact groundwater quality for a very long time.

- **Excavate, Consolidate and Cover Contaminated Soils and Wetland Soils On Site (Alternatives OAR-2 and CP-2)**

  The contaminated soil in the Operations Area and along the railroad (a combined total of 17,000 cubic yards) will be left in place and covered with a multi-layer cap that complies with the federal requirements for hazardous waste landfills (RCRA Subtitle C). The cap will be designed and built with future land use (expected to be recreational) in mind. The cap will prevent human exposure to contaminated soil, and also prevent water (rain, etc) from coming into contact with the contaminants and leaching into the groundwater. Currently, the area to be capped is approximately three acres. That area may become larger or smaller as a result of thermal treatment in the subsurface.

  A porous concrete drainage culvert that runs from the Operations Area, across the Cianci Property to the Quinnipiac River, and collects surface water runoff as well as contaminated groundwater, will be removed. Surface water runoff will be rerouted to the Quinnipiac River via a new non-permeable drainage pipe. Contaminated soil from the wetlands at the culvert outfall (about 500 cubic yards) will be excavated and consolidated under the Operations Area cap. A small number of discrete areas of contaminated soil (about 400 cubic yards) on the Cianci Property that exceed soil cleanup levels will also be excavated and placed under the Operations Area cap.

  Routine operation and maintenance will ensure that the cap remains protective over time. Because the proposed cleanup plan for soil leaves waste above protective levels on site, deed restrictions and/or environmental land-use restrictions (ELURs) will be put in place for the area where the cap is located, to preclude future uses of the site that would impact the integrity of the cap.

- **Pump, Treat, Monitor and Restrict Use of Contaminated Groundwater/Monitored Natural Attenuation (Alternatives OGW-3, BGW-3, and NBGU-2)**

  Groundwater in the overburden and bedrock aquifers that exceeds federal drinking water standards will be captured using vertical extraction wells, and treated on site before it is discharged to the Quinnipiac River. A groundwater containment system is already operating at the site and will continue to operate under this proposed cleanup plan. With this containment system, overburden groundwater is captured by 12 extraction wells and a 700-foot long, 30-foot deep sheet-pile wall installed into the top of bedrock just downgradient of the Operations Area on the Cianci Property. Two extraction wells installed south of the Cianci Property, also capture contaminated overburden groundwater and bedrock groundwater. Once collected, groundwater is treated on site with a process that uses ultraviolet oxidation (UvOx) to remove contaminants. Treated groundwater that meets discharge standards is released to the Quinnipiac River.

  The existing groundwater containment system, which pumps and treats 26,000 gallons per day, will continue to operate in its current configuration at least until implementation of the thermal treatment technology in the Operations Area. The size of the plume that exceeds cleanup requirements is expected to decrease over time. Optimization studies will be conducted periodically to assess how the hydraulic containment and treatment system might be modified to meet changing conditions. If an equally effective, protective and ARAR-compliant treatment technology (e.g., Fenton's Reagent, constructed treatment wetlands) is identified, it may augment or even replace the existing UvOx system.

  Groundwater in the overburden and bedrock aquifers that meets federal drinking water standards, but has contaminants at concentrations greater than upgradient, or background, levels will be further cleaned by ongoing natural degradation processes. The groundwater will be monitored to confirm that these processes continue to occur over time ("monitored natural attenuation", or MNA).

  Unlike the overburden, technologies to recover NAPL from fractured bedrock such as is present at SRSNE, have shown low rates of success. Instead, MNA will naturally continue to degrade the NAPL in the bedrock aquifer over a very long time frame.

  The groundwater at the SRSNE site is not expected to be completely cleaned up for at least 200 years. Until then, deed restrictions and/or environmental land-use restrictions (ELURs), and a groundwater monitoring program, will be in place across the extent of the plume to preclude future uses of groundwater during this time frame, thereby preventing human exposure to the contaminants.

- **Supplemental Groundwater Containment Contingent**

  In the event that the Town of Southington decides in the future to reactivate municipal production wells No. 4 and 6, the proposed remedy includes a contingency to isolate the dissolved solvents coming from the SRSNE Site in the groundwater from the influence of the town wells. This contingency would be implemented prior to the wells restarting, and could include the installation of additional extraction wells. The cost to implement this contingency is $1,380,000.

- **Wetlands and Floodplains Assessment and Proposed Determination**

  Section 404 of the Clean Water Act and Executive Orders 11990 and 11988 (Protection of Wetlands and Protection of Floodplains) require a determination that federal actions involving dredging and filling activities or activities in wetlands or floodplains enhance the natural and beneficial values of wetlands and floodplains. Through its analysis of the data collected for the Remedial Investigation and the results of the ecological risk assessment, EPA believes that because significant, high-level contamination exists in a small area of wetland soils at the culvert outfall on the Cianci Property, there is no practicable alternative to conducting work in the wetlands and floodplains.

  Once EPA determines that there is no practical alternative to conducting work in wetlands, EPA is then required to minimize potential harm or avoid adverse effects to the extent practicable. Best management practices will be used throughout the Site to minimize adverse impacts on the wetlands, floodplains, or wildlife and its habitat. For this reason, EPA did not include an alternative that would cap or contain contaminated wetland soil as these would not minimize impacts to wetlands. Instead, EPA considered two excavation alternatives, other than the No-Action alternative, to clean up contaminated wetland soil. In the proposed alternative (CP-2), the contaminated soil will be removed from the wetlands and placed under the cap on the Operations Area. Damage to surrounding wetlands during excavation will be mitigated through erosion control measures. Wetlands restoration with indigenous species will be conducted consistent with the requirements of federal and state wetlands protection laws. The floodplains will be returned to their natural levels so as to prevent the loss of storage capacity.

- **Five-Year Reviews**

  Because waste is being left in place at the SRSNE Site (not all of the oils and solvents will be removed), EPA will conduct reviews at least every five years. The purpose of the review is to evaluate the status and efficiency of the cleanup, and to ensure that the remedy remains protective of human health and the environment over time.

- **Cost**

  The cost of this remedy, projected over 30 years, is $29,260,000.

How Does EPA Choose a Final Cleanup Plan?

EPA uses nine criteria to compare alternatives and select a final cleanup plan or remedy that meets the statutory goals of protecting human health and the environment, maintaining protection over time and minimizing contamination. These nine criteria make up the assessment process used for all Superfund sites. The following list highlights these nine criteria and some questions EPA must consider in selecting a final cleanup plan. Additional discussion of these nine criteria can be found in Section 4 of the SRSNE Feasibility Study, which is part of the Administrative Record. The Administrative Record, located in the Southington Public Library and at the EPA office in Boston, is a collection of documents generated during the investigation of the SRSNE site that form the basis for selection of the cleanup action. Additional information about the SRSNE Superfund site is also available on the EPA New England website: www.epa.gov/ne/superfund/sites (Type SRSNE into search box).

Threshold Criteria

1. ***Overall protection of human health and the environment***: Will the alternative protect human health and plant and animal life on and near the area? The chosen cleanup plan must meet this criterion.

2. ***Compliance with applicable or relevant and appropriate requirements (ARARs)***: Does the alternative meet all pertinent federal and state environmental statutes, regulations, and requirements? The chosen cleanup plan must meet this criterion.

Balancing Criteria

3. ***Long-term effectiveness and permanence***: How reliable will the alternative be at long-term protection of human health and the environment? Is contamination likely to present a potential risk again?

4. ***Reduction of toxicity, mobility or volume through treatment***: Does the alternative incorporate treatment to reduce the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present?

5. ***Short-term effectiveness:*** How soon will risks be adequately reduced? Are there short-term hazards to workers, the community, or the environment that could occur during the cleanup process?

6. ***Implementability***: Is the alternative technically and administratively feasible? Are the goods and services needed to implement the alternative (e.g., treatment machinery, space at an approved disposal facility) readily available?

7. ***Cost***: What is the total cost of constructing and operating the alternative? Costs presented in this document represent the present worth costs of construction, operations, and monitoring for the anticipated lifetime of the alternative.

Modifying Criteria

8. ***State acceptance***: Do state environmental agencies agree with the recommendations? What are their preferences and concerns?

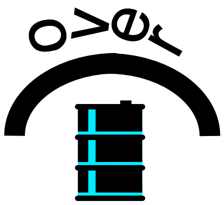
9. ***Community acceptance***: What suggestions or modifications do residents of the community offer during the comment period? What are their preferences and concerns?

Of these nine criteria, protection of human health and the environment and compliance with ARARs are considered threshold criteria that must be met for a candidate cleanup alternative to be selected. The next five criteria, called balancing criteria, are used to evaluate and compare the elements of the alternatives that meet the threshold criteria. This comparison evaluates which alternative provides the best balance of trade-offs with respect to the balancing criteria. State and community acceptance are considered modifying criteria factored into a final balancing of all criteria to select a remedy. Consideration of state and community comments may prompt EPA to modify aspects of the preferred alternative or decide that another alternative provides a more appropriate balance.

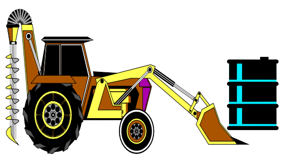
Four Kinds of Cleanup

EPA looks at numerous technical approaches to determine the best way to reduce the risks presented by a Superfund site. EPA then narrows the possibilities to approaches that would protect human health and the environment. Although reducing risks often involves combinations of highly technical processes, there are really only four basic options.

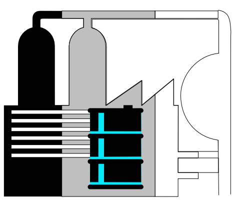
Limited or no action Leave the site as it is, or just restrict access and monitor it.



Contain contaminants Leave contamination where it is and cover or contain it in some way to prevent exposure to, or spread of, contaminants. This method reduces risks from exposure to contamination, but does not destroy or reduce it.



Move contaminants off site Remove contaminated material (soil, groundwater etc.) and dispose of it or treat it elsewhere.



Treat contamination on site Use a chemical or physical process on the site to destroy or remove the contaminants. Treated material can be left on site. Contaminants captured by the treatment process are disposed of at an off-site hazardous waste facility.

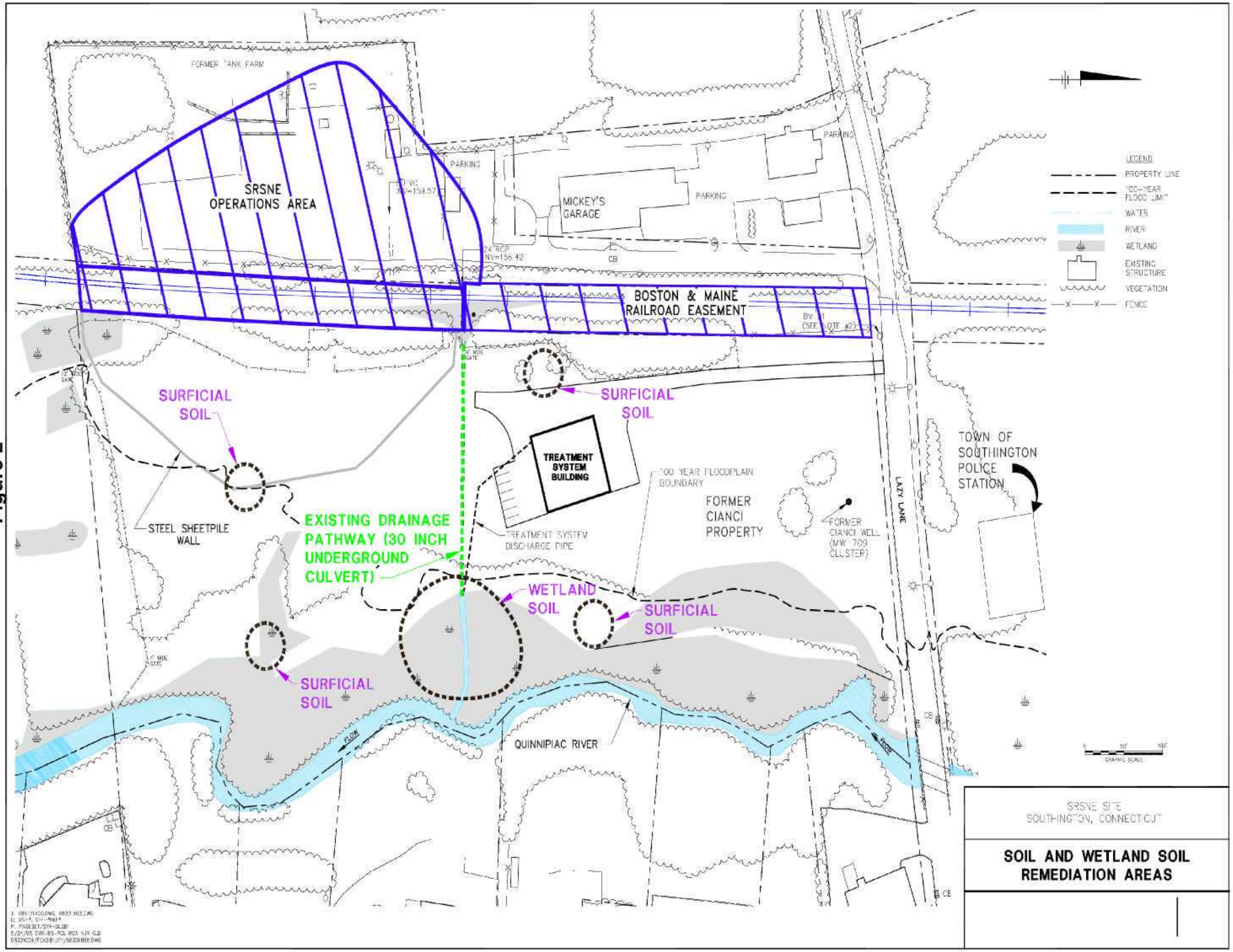
Cleanup Alternatives Considered for the SRSNE Site

EPA considers a full range of options to clean up a Superfund site before selecting a remedy. Many options are screened out early in the process because site-specific conditions render them ineffective and/or technically or administratively infeasible. Others are eliminated because they are cost prohibitive to implement. The options, or cleanup alternatives, that survived the initial screening and were considered for the SRSNE site are summarized below. For consistency, names and numbers of the remedial alternatives presented below remain the same as those used in the SRSNE Feasibility Study (FS).

One alternative for each of the six areas will be selected and, in combination, will comprise the final remedy for this site. The six areas are:

(OAR)	Operations Area/Railroad soil	Three alternatives evaluated in detail in the FS
(CP)	Cianci Property soil and wetland soil	Three alternatives evaluated in detail in the FS
(ONOGU)	Overburden NAPL Area	Six alternatives evaluated in detail in the FS
(OGW)	Overburden Groundwater	Three alternatives evaluated in detail in the FS
(NBGU)	Bedrock NAPL Area	Two alternatives evaluated in detail in the FS
(BGW)	Bedrock Groundwater	Three alternatives evaluated in detail in the FS

Figure 2



FORMER TANK FARM
SRSNE OPERATIONS AREA
PARKING
MICKEY'S GARAGE
PARKING
CB
24" RCP
BOSTON & MAINE RAILROAD EASEMENT
SURFICIAL SOIL
SURFICIAL SOIL
TREATMENT SYSTEM BUILDING
100 YEAR FLOODPLAIN BOUNDARY
FORMER CIANCI PROPERTY
FORMER CIANCI WELL (MW 709 CLUSTER)
TOWN OF SOUTHINGTON POLICE STATION
LAZY LANE
STEEL SHEETPILE WALL
EXISTING DRAINAGE PATHWAY (30 INCH UNDERGROUND CULVERT)
TREATMENT SYSTEM DISCHARGE PIPE
WETLAND SOIL
SURFICIAL SOIL
SURFICIAL SOIL
QUINNIPIAC RIVER
FLOW
FLOW
LEGEND
PROPERTY LINE
100-YEAR FLOOD LIMIT
WATER
RIVER
WETLAND
EXISTING STRUCTURE
VEGETATION
FENCE
GRAPHIC SCALE
SRSNE SITE
SOUTHINGTON, CONNECTICUT
SOIL AND WETLAND SOIL REMEDIATION AREAS

Soil / Wetland Soil

Soil/Wetland Soil = The **OAR** alternatives (1 through 3) address soil in the Operations Area and along the Railroad. The **CP** alternatives (1 through 3) address soil and wetland soil on the former Cianci Property. (See Figure 2)

Limited or No Action

Alternatives OAR-1 and CP-1: No Action

Under these alternatives, nothing would be done to reduce the human and ecological risk associated with either direct exposure to contaminants in soil and wetland soil, or, the affects on groundwater quality as it moves through contaminated soil. EPA is required to look at no action, which provides a baseline for comparison of the other soil/wetland soil alternatives.
Estimated Cost: No capital costs are associated with these alternatives.

Contain Contaminants

Alternative OAR-2: Capping and Institutional Controls

Under this alternative, all soil that exceeds cleanup levels in the Operations Area and along the railroad easement will be capped in a manner that is consistent with hazardous waste landfills (RCRA Subtitle C). Deed restrictions and/or environmental land-use restrictions (ELURs) would be put in place to ensure that the cap is not disturbed and to limit the future use of the property.
Estimated Cost: $1,060,000

Alternative CP-2: Culvert Removal and Excavation with On-site Disposal

Under this alternative, the 30-inch concrete culvert that runs from the Operations Area, across the Cianci Property to the Quinnipiac River and that collects surface runoff as well as contaminated groundwater, will be removed. Surface drainage will be rerouted to the Quinnipiac River via a new non-permeable drainage pipe. Isolated hot spots of soil and wetland soil that pose human health and/or ecological risks will be excavated and placed under the Operations Area cap in OAR-2. This alternative can only be implemented if OAR-2 is selected.
Estimated Cost: $310,000

Move Off Site

Alternative OAR-3: Excavation and Off-site Disposal

Under this alternative, soil that exceeds cleanup levels in the Operations Area and along the railroad (an estimated 17,000 cubic yards) would be excavated and transported off site for incineration and disposal at a commercial treatment facility. The existing asphalt cap in the Operations Area would be removed as well, and the excavated areas would be backfilled with clean soil from an off-site source. Deed restrictions and/or ELURs would be needed to ensure that contaminated soil below the seasonal high groundwater level, which is the lower limit of the excavation, would not be disturbed.
Estimated Cost: $13,230,000

Alternative CP-3: Culvert Removal and Excavation with Off-site Disposal

Under this alternative, the porous 30-inch concrete culvert will be removed; surface drainage to the Quinnipiac River will be rerouted via a new non-permeable drainage pipe; and isolated hot spots of soil and wetland soil that exceed cleanup levels and/or present ecological risks will be excavated, as described previously in Alternative CP-2. However, instead of the excavated material being consolidated and placed under a cap on site, it would be shipped off site for disposal at a commercial treatment facility.
Estimated Cost : $730,000

Overburden Aquifer

Overburden Aquifer = The **ONOGU** alternatives (1 through 6) address the area in the overburden aquifer that has the greatest concentration of undissolved oil and solvent (NAPL). The **OGW** alternatives (1 through4) address the dissolved contaminants in the overburden groundwater which extend beyond the NAPL area.

{See overburden figures on pages 12 and 13}

Limited or No Action

Alternatives ONOGU-1 and OGW-1: No Action

Under these alternatives, nothing would be done to address the contamination that exists in the overburden aquifer either as undissolved oil and solvent or as a dissolved phase in the groundwater. EPA is required to look at no action, which provides a baseline for comparison of the other alternatives.
Estimated Cost: No capital costs are associated with these alternatives.

Alternative OGW-2: Institutional Controls and MNA

Under this alternative, institutional controls in the form of deed restrictions and/or ELURs would be put in place to limit potential future use of contaminated groundwater. Natural degradation processes would continue to reduce contaminant levels. Monitored natural attenuation, or MNA, would be conducted to assess the effectiveness of the natural processes in the overburden aquifer over time.
Estimated Cost: $2,590,000

Contain Contaminants

Alternative OGW-3: Hydraulic Containment and MNA

Under this alternative, groundwater that exceeds federal drinking water standards would be extracted and treated on site. The treated groundwater would be discharged to the Quinnipiac River. MNA would be used to treat the groundwater outside the containment area which meets federal cleanup levels but contains compounds in concentrations higher than what is found in upgradient, or background, groundwater. Institutional controls in the form of deed restrictions and/or ELURs, and a groundwater monitoring program, would be put in place to limit during this time frame potential future use of contaminated groundwater.
Estimated Cost: $9,570,000

Alternative OGW-4: Supplemental Containment Under Pumping Conditions (Contingent)

Currently, Southington Town Wells No. 4 and 6 are inactive. Should they be reactivated, under this alternative, groundwater extraction wells would be installed at a location designed to intercept contaminants in the overburden aquifer that could migrate towards either or both of these wells during pumping conditions. The extracted groundwater would be treated on site, and the treated water discharged to the Quinnipiac River. This contingent alternative would be a component of whichever OGW alternative is selected for the final remedy. Long-term monitoring of groundwater conditions would also be a component of this alternative.
Estimated Cost: $1,380,000

Move Contaminants Off Site

Alternative ONOGU-6: Excavation and Disposal Off Site

Under this alternative, contaminated material in the area of greatest oil and solvent concentration in the overburden aquifer, and contaminated soil in the Operations Area, would be excavated. Excavation would require the removal of 50,000 cubic yards of material to depths of about 20 feet below the water table which would be transported off site for treatment and disposal at a commercial hazardous waste facility. Implementation of this alternative would require dewatering activities, and the groundwater would be treated on site prior to discharge to the Quinnipiac River. The excavation would be backfilled with clean soil from an off-site source.
Estimated Cost: $39,970,000

Overburden Aquifer

On-site Treatment

Alternative ONOGU-2: Hydraulic Displacement and MNA

Under this alternative, pairs of wells - one pumping and one extraction - would be located across the area where the greatest concentration of undissolved oil and solvent (NAPL) exist in the subsurface. Adding water to pumping wells and removing it from extraction wells hydraulically displaces, or "flushes", a portion of the NAPL towards extraction wells or trenches where it is captured and removed. The extracted NAPL/water mix would be separated; the water would be treated on site and the NAPL would be drummed and shipped off site for treatment and disposal. The flushing action of the circulated water also has the affect of turning remaining pools of NAPL into smaller droplets or "residual" NAPL resulting in a reduction of its mobility, and a significant increase in the surface area available for subsequent treatment. After hydraulic displacement is completed, MNA would treat any undissolved oil and solvent that remains and assess the effectiveness of natural degradation processes over time.
Estimated Cost: $6,190,000

Alternative ONOGU-3: Hydraulic Displacement and Enhanced Bioremediation

Under this alternative, hydraulic displacement, as described in Alternative ONOGU-2, would be used to recover a portion of the undissolved soil and solvent and increase the surface area of that which remains. Instead of MNA, the hydraulic displacement step would be followed by enhanced bioremediation. During enhanced bioremediation, nutrients are added to the aquifer and/or existing bacteriological culture(s) are supplemented, to increase the rate at which natural biodegradation processes occur.
Estimated Cost: $9,640,000

Alternative ONOGU-4: Hydraulic Displacement, Chemical Oxidation and MNA

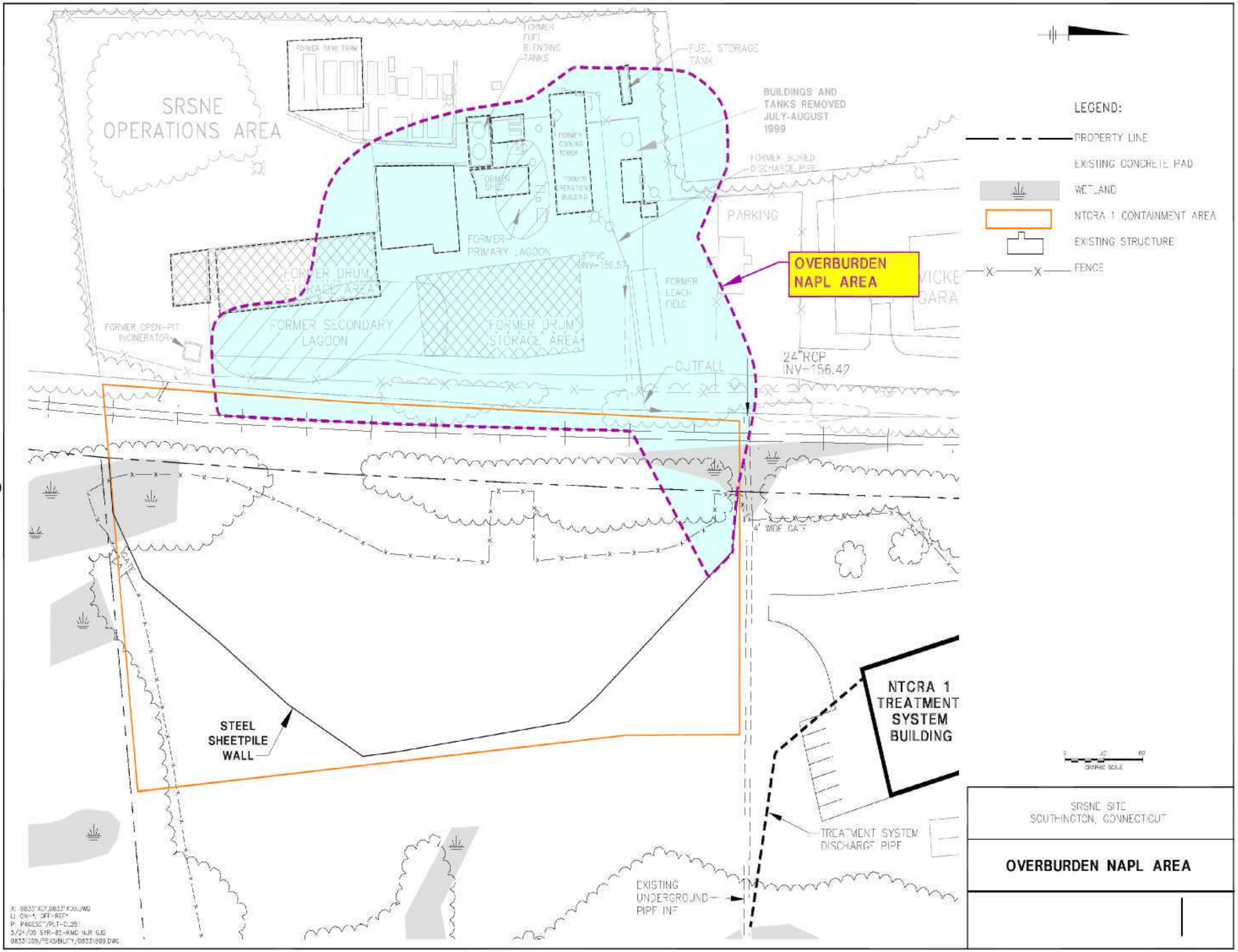
As in Alternatives ONOGU-2 and ONOGU-3, the first step under this alternative is hydraulic displacement. The hydraulic displacement phase would be followed by chemical oxidation. Chemical oxidation involves the injection of a permanganate or persulfate solution into the overburden aquifer to oxidize and further reduce the contamination in the subsurface. Chemical oxidation would be followed by MNA, which would treat any undissolved oil and solvent that remains.
Estimated Cost: $20,130,000

Alternative ONOGU-5: In-Situ Thermal Treatment and MNA

Under this alternative, the subsurface is heated with electrodes and/or thermal wells. This causes the undissolved oil and solvent to be converted to a vapor phase. A vapor extraction and treatment system would be needed to remove and treat the contaminants in the vapor phase. The vapor extraction system would likely require the construction of a surface cap to prevent the release of gases containing high concentrations of contaminants. MNA would treat any undissolved oil and solvent that remains after treatment.
Estimated Cost: $17,660,000

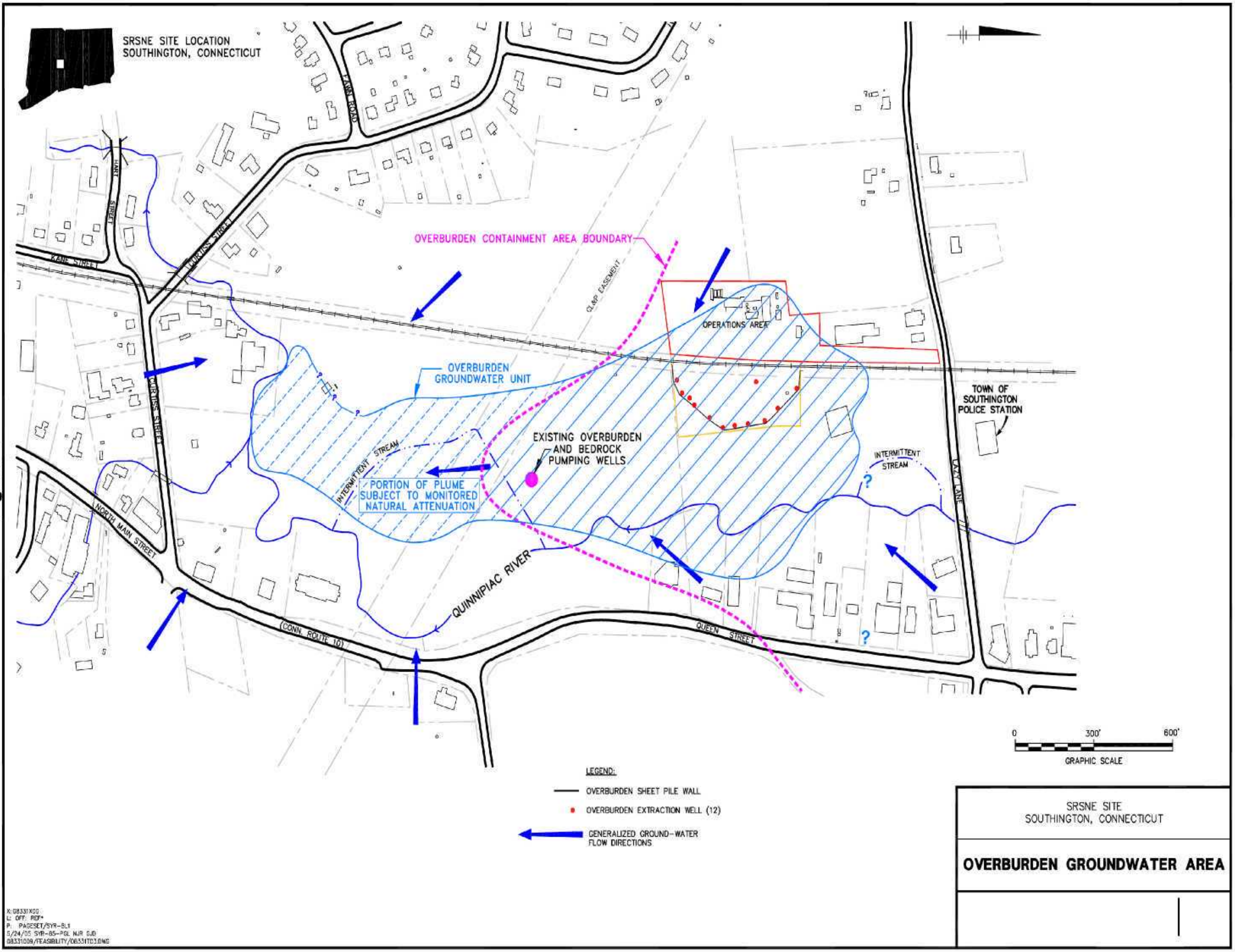
Existing treatment building located on Cianci property on Lazy Lane.

Figure 3



SRSNE OPERATIONS AREA
FORMER TANK FARM
FORMER FUEL BLENDING TANKS
FUEL STORAGE TANK
BUILDINGS AND TANKS REMOVED JULY-AUGUST 1999
FORMER COOLING TOWER
FORMER SHED
FORMER OPERATIONS BUILDING
FORMER BURIED DISCHARGE PIPE
PARKING
FORMER PRIMARY LAGOON
8"PVC INV=159.57
FORMER DRUM STORAGE AREA
FORMER LEACH FIELD
OVERBURDEN NAPL AREA
FORMER OPEN-PIT INCINERATOR
FORMER SECONDARY LAGOON
FORMER DRUM STORAGE AREA
24"RCP INV=156.42
OUTFALL
4' WIDE GATE
STEEL SHEETPILE WALL
NTCRA 1 TREATMENT SYSTEM BUILDING
TREATMENT SYSTEM DISCHARGE PIPE
EXISTING UNDERGROUND PIPELINE
LEGEND:
PROPERTY LINE
EXISTING CONCRETE PAD
WETLAND
NTCRA 1 CONTAINMENT AREA
EXISTING STRUCTURE
FENCE
GRAPHIC SCALE
SRSNE SITE
SOUTHINGTON, CONNECTICUT
OVERBURDEN NAPL AREA

Figure 4


SRSNE SITE LOCATION
SOUTHINGTON, CONNECTICUT
OVERBURDEN CONTAINMENT AREA BOUNDARY
OPERATIONS AREA
OVERBURDEN GROUNDWATER UNIT
EXISTING OVERBURDEN AND BEDROCK PUMPING WELLS
PORTION OF PLUME SUBJECT TO MONITORED NATURAL ATTENUATION
INTERMITTENT STREAM
QUINNIPIAC RIVER
TOWN OF SOUTHINGTON POLICE STATION
KANE STREET
CURTISS STREET
HART STREET
NORTH MAIN STREET
(CONN. ROUTE 10)
QUEEN STREET
LAZY LANE
CL&P EASEMENT
0
300'
600'
GRAPHIC SCALE
LEGEND:
OVERBURDEN SHEET PILE WALL
OVERBURDEN EXTRACTION WELL (12)
GENERALIZED GROUND-WATER FLOW DIRECTIONS
SRSNE SITE
SOUTHINGTON, CONNECTICUT
OVERBURDEN GROUNDWATER AREA

Bedrock Aquifer

Bedrock Aquifer = The **NBGU** alternatives (1 and 2) address the undissolved oils and solvent (NAPL) in the bedrock aquifer. The **BGW** alternatives (1 through 3) address the groundwater plume of dissolved contaminants in the bedrock.

Limited or No Action

Alternatives NBGU-1 and BGW-1: No Action

Under these alternatives, nothing would be done to address the contamination that exists in the bedrock aquifer either as undissolved oil and solvent or as a dissolved phase in the groundwater. EPA is required to look at no action, which provides a baseline for comparison of the other alternatives.
Estimated Cost: No capital costs are associated with these alternatives.

Alternative NBGU-2: Institutional Controls and MNA

Under this alternative, institutional controls in the form of deed restrictions and/or ELURs would be put in place to limit potential future exposure to the NAPL in the bedrock. Natural degradation processes would continue to reduce contaminant levels. Monitored natural attenuation, or MNA, would be conducted to assess the effectiveness of these natural processes in reducing NAPL over time.
Estimated Cost: Because the NBGU area overlaps with the BGW area, the cost to implement institutional controls and MNA is included with the BGW alternatives.

Alternative BGW-2: Institutional Controls and MNA

Under this alternative, institutional controls in the form of deed restrictions and/or ELURs would be put in place to limit potential future exposure to contaminants that are dissolved in the groundwater. Natural degradation processes would continue to reduce contaminant levels, and MNA would be conducted to assess its effectiveness in the bedrock aquifer over time.
Estimated Cost: $660,000

Contain Contaminants

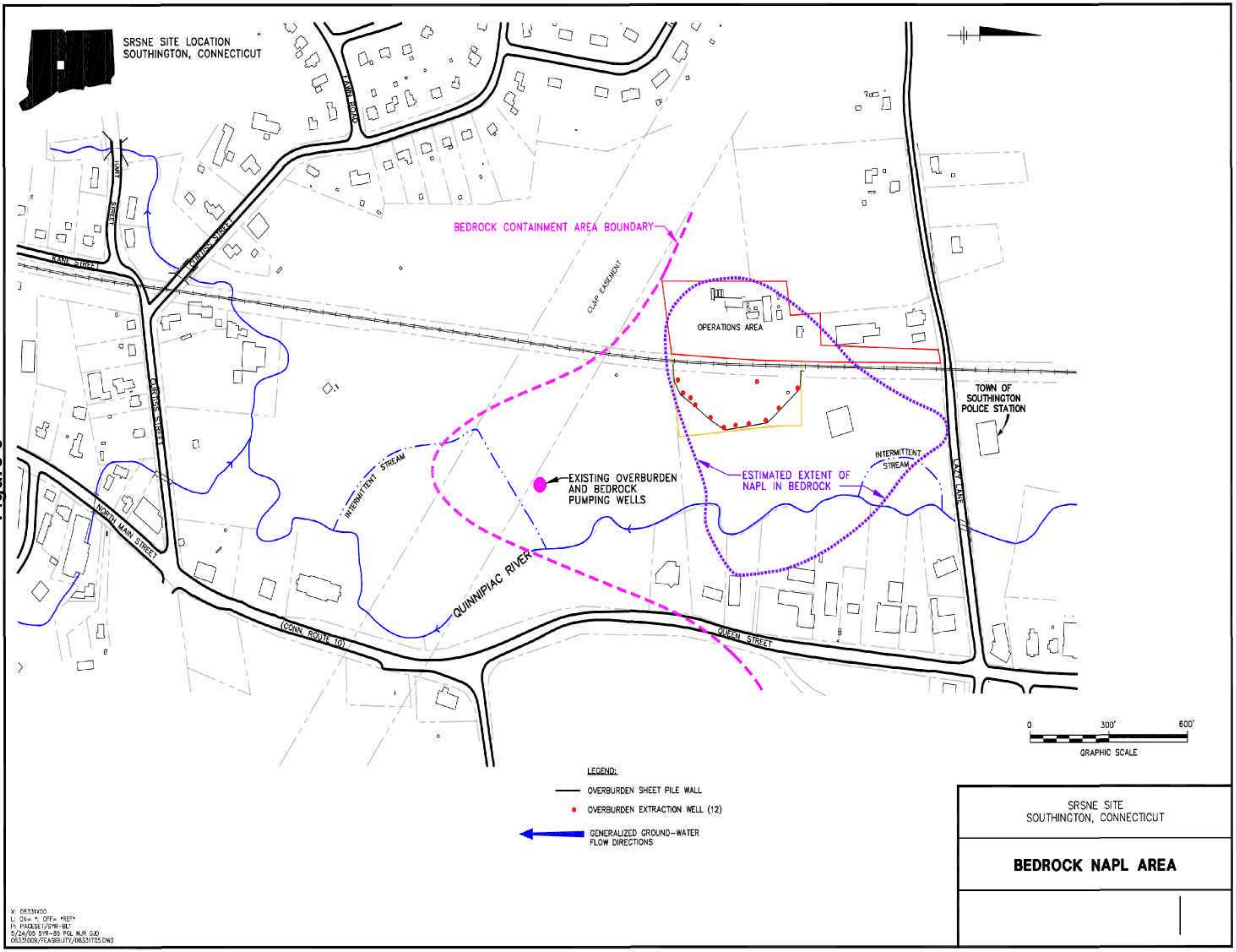
Alternative BGW-3: Hydraulic Containment and MNA

Under this alternative, groundwater that exceeds federal drinking water standards would be extracted and treated on site in a modification of the existing treatment system. The treated groundwater would be discharged to the Quinnipiac River. MNA would treat the groundwater outside the containment area which meets federal cleanup levels but contains compounds in concentrations higher than what is found in upgradient, or background, groundwater. Institutional controls in the form of deed restrictions and/or ELURs would be put in place to limit potential future use of contaminated groundwater.
Estimated Cost: $660,000

Current view of Operations Area where all buildings have been removed.

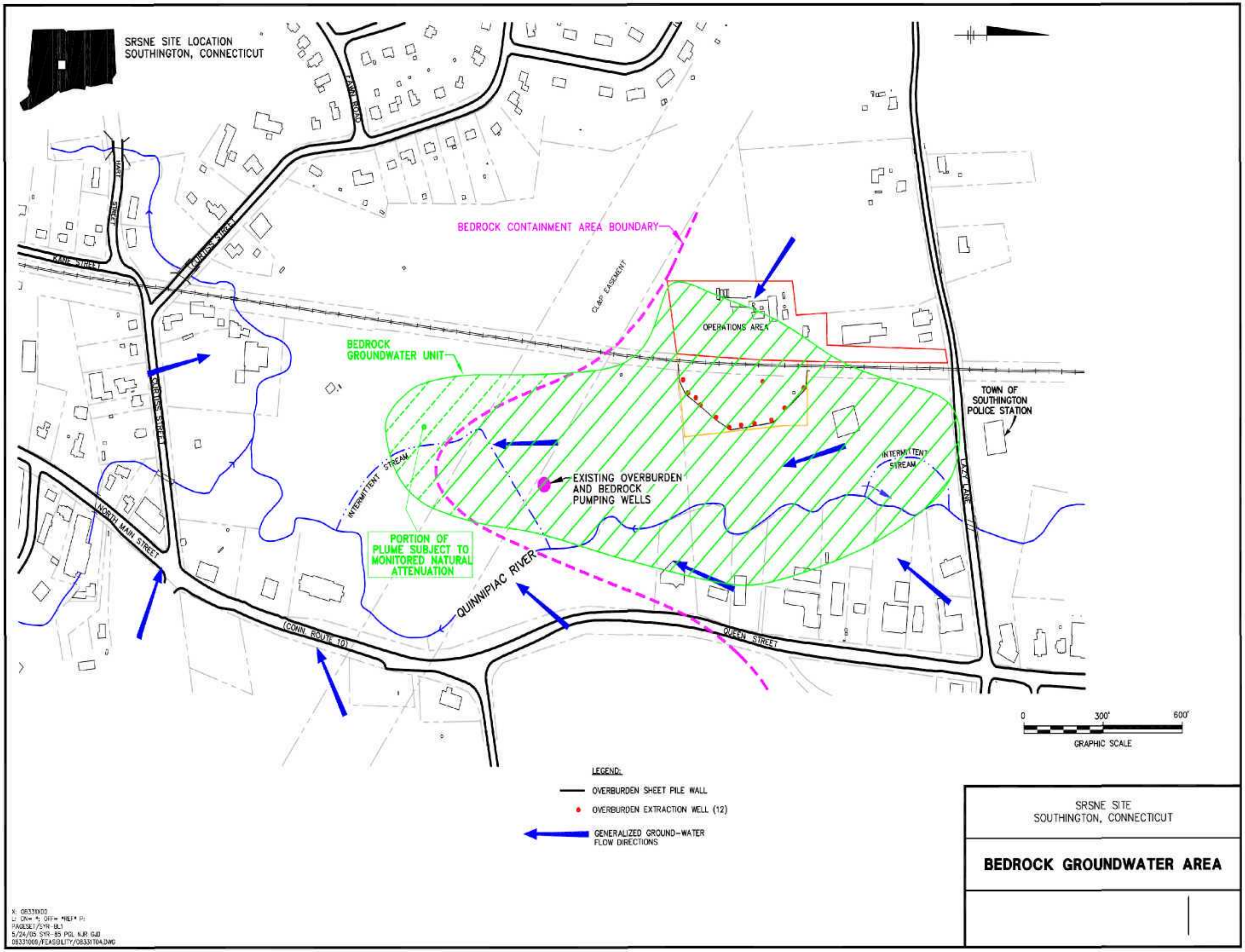
View of Railroad right of way, looking south from Lazy Lane

Figure 5



SRSNE SITE LOCATION
SOUTHINGTON, CONNECTICUT
BEDROCK CONTAINMENT AREA BOUNDARY
CL&P EASEMENT
OPERATIONS AREA
TOWN OF SOUTHINGTON POLICE STATION
INTERMITTENT STREAM
ESTIMATED EXTENT OF NAPL IN BEDROCK
EXISTING OVERBURDEN AND BEDROCK PUMPING WELLS
INTERMITTENT STREAM
QUINNIPIAC RIVER
KANE STREET
HART STREET
CURTISS STREET
LAZY LANE
NORTH MAIN STREET
(CONN. ROUTE 10)
QUEEN STREET
0
300'
600'
GRAPHIC SCALE
LEGEND:
OVERBURDEN SHEET PILE WALL
OVERBURDEN EXTRACTION WELL (12)
GENERALIZED GROUND-WATER FLOW DIRECTIONS
SRSNE SITE
SOUTHINGTON, CONNECTICUT
BEDROCK NAPL AREA
X: 08331X00
L: ON= *; OFF= *REF*
P: PACESET/SYR-BLT
5/24/05 SYR-85 PGL NJR GJD
08331009/FEASIBILITY/08331T05.DWG

Figure 6



SRSNE SITE LOCATION
SOUTHINGTON, CONNECTICUT
BEDROCK CONTAINMENT AREA BOUNDARY
BEDROCK
GROUNDWATER UNIT
OPERATIONS AREA
CL&P EASEMENT
TOWN OF
SOUTHINGTON
POLICE STATION
EXISTING OVERBURDEN
AND BEDROCK
PUMPING WELLS
INTERMITTENT STREAM
PORTION OF
PLUME SUBJECT TO
MONITORED NATURAL
ATTENUATION
QUINNIPIAC RIVER
KANE STREET
CURTISS STREET
HART STREET
FAWN ROAD
NORTH MAIN STREET
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QUEEN STREET
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GRAPHIC SCALE
LEGEND:
OVERBURDEN SHEET PILE WALL
OVERBURDEN EXTRACTION WELL (12)
GENERALIZED GROUND-WATER
FLOW DIRECTIONS
SRSNE SITE
SOUTHINGTON, CONNECTICUT
BEDROCK GROUNDWATER AREA

Evaluation of Alternatives

EPA uses nine criteria (described on Page 6) to balance the advantages and disadvantages of various cleanup alternatives. As summarized below, EPA has evaluated how well each of the cleanup alternatives meets the first seven criteria. Once comments from the state and the community are received, EPA will select the final cleanup plan. A more detailed evaluation of the alternatives can be found in the Feasibility Study. The proposed remedy has been highlighted.

Overall Protection of Human Health and the Environment

Soil/Wetland Soil: Alternatives OAR-1 (No Action Operations Area/Railroad) and CP-1 (No Action Cianci Property) will not protect human health and the environment because no action would be taken to address the risks posed by the contaminated soil and wetland soil.

Alternatives OAR-2 (Cap Operations Area/Railroad), OAR-3 (Excavation/Off-site Disposal Operations Area/Railroad), CP-2 (Excavation/On-site Disposal Cianci Property) and CP-3 (Excavation/Off-site Disposal Cianci Property) all will protect human health and the environment. Each of these alternatives will eliminate exposure to contaminated soil and wetland soil exceeding cleanup levels. Alternatives OAR-2 and CP-2 will prevent exposure by placing the contaminated material under a multi-layer cap on site, and using deed restrictions and/or ELURs to prevent future disturbance of the cap/contaminated material. These controls are only adequate and reliable if they are monitored and enforced in the long term. Alternatives OAR-3 and CP-3 which remove soil and wetland soil that pose an unacceptable risk, provide the greatest degree of overall protection by permanently removing this material from the site.

Overburden Aquifer: Alternatives ONOGU-1 (No Action Overburden NAPL Area), and OGW-1 (No Action Overburden Groundwater), will not protect human health and the environment because no action would be taken to address the risks posed by the undissolved oil and solvent (NAPL) and dissolved contaminants in the overburden aquifer.

ONOGU-6 (Excavation/Off-Site Disposal) provides the greatest protection of human health and the environment from exposure to NAPL in the Overburden NAPL Area by removing it and taking it off site. The remaining alternatives for the Overburden NAPL Area (ONOGU-2 thru ONOGU-5) all will achieve cleanup objectives and will be equally protective of human health and the environment in the long term. They differ from each other in the amount of NAPL mass that remains after implementation of the initial phase(s) of treatment. Alternatives ONOGU-5 (Thermal Treatment/MNA) and ONOGU-4 (Hydraulic Displacement/Chemical Oxidation/MNA) will remove upwards of 95% of the NAPL mass prior to MNA. The hydraulic displacement component of ONOGU-3 and ONOGU-2 will remove up to 44% of NAPL mass, leaving more than half to be addressed by enhanced bioremediation (ONOGU-3) or MNA (ONOGU-2). Alternatives ONOGU-2 and ONOGU-3 both require much longer durations of time to achieve further reductions in contamination than ONOGU-4 thru ONOGU-6. Downward mobilization of NAPL during implementation of any of the ONOGU alternatives could increase the amount of time to achieve cleanup objectives; the risk for downward mobilization is greatest for ONOGU-5 and ONOGU-6. The Overburden NAPL Area alternatives include provisions for institutional controls to prevent human exposure to NAPL, and five-year reviews to ensure that the remedy remains protective.

The alternatives for Overburden Groundwater, OGW-2 (Institutional Controls/MNA) and OGW-3 (Hydraulic Containment/MNA) rely on institutional controls to prevent human exposure to the dissolved contaminants in the groundwater as well as any NAPL that is outside the area targeted for treatment under the ONOGU alternatives. Alternative OGW-3 is more protective because the hydraulic containment component prevents the groundwater plume from spreading.

Bedrock Aquifer: Alternatives NBGU-1 (No Action Bedrock NAPL Area) and BGW-1 (No Action Bedrock Groundwater) will not protect human health and the environment because no action would be taken to address risks posed by the NAPL and dissolved contaminants in the bedrock aquifer.

Alternatives NBGU-2 (Institutional Controls/MNA Bedrock NAPL Area), BGW-2 (Institutional Controls/MNA Bedrock Groundwater), and BGW-3 (Hydraulic Containment/MNA Bedrock Groundwater) all provide protection of human health and the environment through the use of institutional controls to prevent exposure to contaminants in the bedrock aquifer which exists as NAPL in fractures in the bedrock or dissolved phase in the groundwater, and, MNA to restore groundwater quality to cleanup levels in a reasonable time frame. Alternative BGW-3 affords greater overall protection than BGW-2 because the hydraulic containment component prevents the groundwater plume from spreading.

Compliance with Applicable or Relevant and Appropriate Environmental Requirements (ARARs)

Soil/Wetland Soil: Alternatives OAR-1 (No Action Operations Area/Railroad) and CP-1 (No Action Cianci Property) will not meet appropriate federal/state cleanup requirements. Alternatives OAR-2 (Cap Operations Area/Railroad), OAR-3 (Excavation/Off-site Disposal Operations Area/Railroad), CP-2 (Excavation/On-site Disposal Cianci Property) and CP-3 (Excavation/Off-site Disposal Cianci Property) will meet appropriate federal/state cleanup requirements.

Overburden Aquifer: Alternatives ONOGU-1 (No Action Overburden NAPL Area) and OGW-1 (No Action Overburden

Groundwater) will not meet ARARs applicable to this Site. All the remaining ONOGU alternatives would be designed and implemented to meet all appropriate federal/state cleanup requirements.

Both Alternatives OGW-2 (Institutional Controls/MNA Overburden Groundwater) and OGW-3 (Hydraulic Containment/MNA Overburden Groundwater) would also be designed to comply with appropriate federal/state cleanup requirements. Alternative OGW-3 would require compliance with several additional requirements that apply to the hydraulic containment component which are not applicable to OGW-2.

Bedrock Aquifer: Alternative NBGU-1 (No Action Bedrock NAPL Area) will not meet federal/state cleanup requirements applicable for this site. Alternative NBGU-2 (Institutional Controls/MNA Bedrock NAPL Area) will be designed to meet appropriate federal/state cleanup requirements.

Alternative BGW-1 (No Action Bedrock Groundwater) will not meet federal/state cleanup requirements applicable to the site. Both Alternatives BGW-2 (Institutional Controls/MNA Bedrock Groundwater) and BGW-3 (Hydraulic Containment/MNA Bedrock Groundwater) would be designed to comply with appropriate cleanup requirements. Alternative BGW-3 would require compliance with several additional requirements that would apply to the hydraulic containment component which are not applicable to BGW-2.

Long-Term Effectiveness and Permanence

Soil/Wetland Soil: The no-action alternatives, OAR-1 (Operations Area/Railroad) and CP-1 (Cianci Property) do not provide any long-term effectiveness or permanence.

Alternatives OAR-2 (Cap Operations Area/Railroad), OAR-3 (Excavation/Off-site Disposal Operations Area/Railroad), CP-2 (Excavation/On-site Disposal Cianci Property) and CP-3 (Excavation/Off-site Disposal Cianci Property) all will provide both long-term effectiveness and permanence. Regular inspections and cap maintenance would be required under Alternatives OAR-2 and CP-2 in order for these alternatives to remain effective in the long term, as would periodic reviews of the effectiveness of the remedy since hazardous materials would be left on site.

Alternatives OAR-3 (Excavation/Off-site Disposal Operations Area/Railroad) and CP-3 (Excavation/Off-site Disposal Cianci Property) provide the greatest degree of long-term effectiveness and permanence because the contaminated material is excavated and permanently removed from the site.

Overburden Aquifer: The no-action alternatives, ONOGU-1 (Overburden NAPL Zone) and OGW-1 (Overburden Groundwater), do not provide any long-term effectiveness or permanence that can be assessed.

Alternative ONOGU-6 would have the highest long-term effectiveness and permanence in the Overburden NAPL Area in that it would result in the permanent removal of all the NAPL and contaminated soil from the treatment area. Alternatives ONOGU-2 thru ONOGU-5 would have comparable long-term permanence, although alternatives ONOGU-4 (Hydraulic Displacement/Chemical Oxidation/MNA) and ONOGU-5 (Thermal Treatment/MNA) would have greater long-term effectiveness than ONOGU-2 (Hydraulic Displacement/MNA) and ONOGU-3 (Hydraulic Displacement/Enhanced Bioremediation) because the former are expected to remove at least 95% of the NAPL mass during active treatment. However, the deposition of manganese oxides during the chemical oxidation step of ONOGU-4 could affect its long-term efficiency. Alternatives ONOGU-2 thru ONOGU-5 would also include post-treatment monitoring to support either the MNA or enhanced bioremediation component and would require five-year reviews to determine protectiveness and effectiveness over time.

The Overburden Groundwater alternatives, OGW-2 (Institutional Controls/MNA) and OGW-3 (Hydraulic Containment/MNA) both will provide long-term effectiveness and permanence by restricting the use of groundwater through institutional controls, and MNA to achieve cleanup levels. However, if no action is taken in the Overburden NAPL Area, or, the contingent overburden groundwater alternative (OGW-4) is implemented, OGW-3 will provide a higher level of long-term effectiveness and permanence than OGW-2 because the hydraulic containment component will prevent the spread of the groundwater plume that exceeds federal drinking water standards.

Bedrock Aquifer: The no-action alternatives, NBGU-1 (No Action Bedrock NAPL Area) and BGW-1 (No Action Bedrock Groundwater), do not provide any long-term effectiveness or permanence that can be assessed.

Alternatives NBGU-2 (Institutional Controls/MNA Bedrock NAPL Area), BGW-2 (Institutional Controls/MNA Bedrock Groundwater) and BGW-3 (Hydraulic Containment/MNA Bedrock Groundwater) all will provide long-term effectiveness and permanence by restricting exposure to NAPL and the use of groundwater through institutional controls, and MNA to achieve cleanup levels. Alternative BGW-3 provides slightly more long-term effectiveness because contaminated groundwater is captured and treated.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Soil/Wetland Soil: There is no reduction in toxicity, mobility or volume under the No-action alternatives, OAR-1 (Operations Area/Railroad) and CP-1 (Cianci Property).

Alternatives OAR-2 (Cap Operations Area/Railroad) and CP-2 (Excavation/On-site Disposal Cianci Property) will reduce the mobility, although not by treatment, of the chemical compounds that are placed beneath the cap by preventing water from coming into contact with the contaminated material and leaching into the groundwater.

Alternatives OAR-3 (Excavation/Off-Site Disposal Operations Area/Railroad) and CP-3 (Excavation/Off-site Disposal Cianci Property) will reduce toxicity, mobility and volume, although not by treatment, by removing the contaminated soil and wetland soil from the site. In addition, by replacing the existing porous culvert, both CP-2 and CP-3 will eliminate this pathway for contaminated groundwater to reach surface water.

Overburden Aquifer: The no-action alternatives, ONOGU-1 and OGW-1, will not reduce contaminant toxicity, mobility, or volume through removal and/or active treatment.

Alternatives ONOGU-2 (Hydraulic Displacement/MNA), ONOGU-3 (Hydraulic Displacement/Enhanced Bioremediation), ONOGU-4 (Hydraulic Displacement/Chemical Oxidation/MNA) and ONOGU-5 (Thermal Treatment/MNA) would ultimately achieve a similar level of reduction in contaminant toxicity, mobility and volume through treatment in the long term. However, more contaminant would be removed in a shorter period of time under ONOGU-4 and ONOGU-5 than under ONOGU-2 and ONOGU-3. This would result in more immediate reductions in contaminant toxicity, mobility and volume under ONOGU-4 and ONOGU-5. The mobility of contaminants in the Overburden NAPL Area would be reduced at the completion of the hydraulic displacement phase of ONOGU-2 thru ONOGU-4, and at the completion of the thermal phase of ONOGU-5. The toxicity and volume would be further reduced upon completion of the follow-on treatment steps (i.e., MNA, chemical oxidation or enhanced bioremediation). In the short-term, PCBs and/or metals may remain at concentrations above cleanup levels after treatment under ONOGU-2 thru ONOGU-5. However, their concentrations are expected to meet cleanup levels in the long term as solubility of PCBs (which are co-located with the NAPL) decreases, and, metals stabilize with the removal of solvents from the subsurface. Alternative ONOGU-6 (Excavation/Off-site Disposal) would have the greatest reduction in contaminant toxicity, volume, and mobility by removing contaminants from the site.

The MNA component of Overburden Groundwater alternatives OGW-2 (Institutional Controls/MNA) and OGW-3 (Hydraulic Containment/MNA) would result in the permanent and irreversible reduction in contaminant toxicity, mobility and volume through treatment, by the natural degradation processes that occur in the subsurface. The hydraulic containment component of OGW-3 would provide additional reduction in mobility, and the groundwater treatment system would permanently reduce the toxicity and volume of dissolved contaminants in the extracted groundwater.

Bedrock Aquifer: The no-action alternatives, NBGU-1 (Bedrock NAPL Area) and BGW-1 (Bedrock Groundwater) will not reduce contaminant toxicity, mobility, or volume through removal and/or active treatment.

Natural degradation processes will reduce the level of contamination in the bedrock aquifer over time, however, only Alternatives NBGU-2 (Institutional Controls/MNA Bedrock NAPL Area), BGW-2 (Institutional Controls/MNA Bedrock Groundwater) and BGW-3 (Hydraulic Containment/MNA Bedrock Groundwater) have a monitoring component that would document this decrease.

Alternative BGW-3 would provide additional reduction in mobility of contaminants through the use of hydraulic containment, and, toxicity and volume of contaminants through treatment of the extracted groundwater.

Short-Term Effectiveness

Soil/Wetland Soil: Both Alternatives OAR-1 (No Action Operations Area/Railroad) and CP-1 (No Action Cianci Property) have the no short-term impacts since there would be no short-term risks posed to the community or on-site workers during implementation of the alternative, nor impacts to the environment. However, the no-action alternatives would not achieve protection at any time.

Alternatives OAR-2 (Cap Operations Area/Railroad), CP-2 (Excavation/On-site Disposal Cianci Property), and CP-3 (Excavation/Off-site Disposal Cianci Property) have moderate potential short-term impacts to on-site workers and the community that would have to be addressed. Particulate (dust) and VOC emissions may increase during construction of the cap and excavation of the hot spots on the Cianci Property. This can be addressed with proper health and safety procedures, standard dust control techniques, and air monitoring around the perimeter of the site. Alternative OAR-3 (Excavation/Off-site Disposal Operations Area/Railroad) has the greatest potential for short-term impacts due to the magnitude of risk posed to on-site workers and the community during the excavation and transport of highly-contaminated soil.

The excavation of wetland soils under Alternatives CP-2 and CP-3 will result in short-term impacts to the environment. However, both alternatives include habitat restoration and do not reduce flood storage capacity, so the impacts are temporary.

Alternatives OAR-2, OAR-3, CP-2 and CP-3 would all be protective immediately after implementation.

Overburden Aquifer: Alternatives ONOGU-1 (No Action Overburden NAPL Area) and OGW-1 (No Action Overburden Groundwater) have no short-term impacts since there would be no short-term risks posed to on-site workers or the community during implementation, nor impacts to the environment. With no action taken to reduce risk, natural degradation processes would remove virtually all (99%) of the NAPL mass in the overburden aquifer in 400 to 500 years.

Alternatives ONOGU-2 (Hydraulic Displacement/MNA) and ONOGU-3 (Hydraulic Displacement/Enhanced Bioremediation) would have some potential short-term impacts to on-site workers and the community that would have to be addressed and no environmental impacts that would have to be addressed. Alternative ONOGU-4 (Hydraulic Displacement/Chemical Oxidation/MNA) would have additional potential short-term impacts associated with the transportation, handling and injection of large volumes of oxidant chemicals. Alternatives ONOGU-5 (Thermal Treatment/MNA) and ONOGU-6 (Excavation/Off-site Disposal) have potentially greater impacts resulting from the complexity of the alternatives, the potential for escape of emissions during construction and operation and/or transporting large quantities of contaminated material over public roadways. Approximately 2,400 truckloads of excavated material under ONOGU-6 would be sent to Model City, NY, over existing public roads and highways. A similar number of truckloads of clean backfill materials would be imported to the site. These potential impacts would be addressed by following standard health, safety and transportation practices, and monitoring.

In terms of time until protection is achieved in the Overburden NAPL Area, ONOGU-6 ranks the highest as protection is achieved in three to four years. The hydraulic displacement component of ONOGU-2 thru ONOGU-4 is expected to remove up to 44% of the NAPL mass in less than a year. With MNA (ONOGU-2), virtually all of the remaining NAPL mass would be removed in 300 to 400 years. With enhanced bioremediation (ONOGU-3), virtually all of the remaining NAPL mass would be removed in 40 to 130 years, depending on how aggressive a degradation rate can be achieved. With chemical oxidation and MNA (ONOGU-4), virtually all of the remaining NAPL mass would be removed in 50 to 150 years. Alternative ONOGU-5 will remove virtually all mass in 50 to 150 years if the technology is able to remove 95% of the mass initially, 40 to 100 years if it removes 97%, and seven years if it attains a removal efficiency rate of 99%.

Alternative OGW-2 (Institutional Controls/MNA) has slightly fewer potential short-term impacts than OGW-3 (Hydraulic Containment/MNA) in the Overburden Groundwater as there is little risk to on-site workers, the community and the environment. There is somewhat higher risk to on-site workers under OGW-3 as it requires the handling of contaminated groundwater and treatment residuals. However, these risks would be addressed by following standard health and safety practices.

In the short term, both OGW-2 and OGW-3 would provide protectiveness with the implementation of institutional controls, which OGW-1 would not do. In the long term, all the OGW alternatives would achieve protection due to natural degradation processes. The time frame for this to occur will depend on the alternative selected for the Overburden NAPL Area, but is not likely to be less than 200 years due to the upwelling of contaminated bedrock groundwater into the overburden aquifer.

Bedrock Aquifer: Alternatives NBGU-1 (No Action Bedrock NAPL Area), NBGU-2 (Institutional Controls/MNA Bedrock NAPL Area), BGW-1 (No Action Bedrock Groundwater), and BGW-2 (Institutional Controls/MNA Bedrock Groundwater) have no short-term impacts on the community or on-site workers during implementation, nor do they present short-term environmental impacts. Alternative BGW-3 (Hydraulic Containment/MNA Bedrock Groundwater) has somewhat higher risks to on-site workers as it requires the handling of contaminated groundwater and treatment residuals. However, these risks would be addressed by following standard health and safety practices.

In the short term, NBGU-2, BGW-2 and BGW-3 would provide protectiveness with the implementation of institutional controls, which NBGU-1 and BGW-1 would not do. In the long term, all the NBGU and BGW alternatives would likely achieve protection in an estimated 200 years due to natural degradation processes.

Implementability

Soil/Wetland Soil: Alternatives OAR-1 (No Action Operations Area/Railroad) and CP-1 (No Action Cianci Property) are the easiest to implement because no remedial actions are required.

The remaining OAR and CP alternatives involve the use of capping and/or excavation which are both proven technologies and are both technically and administratively implementable. The excavation of the Operation Area (OAR-3) will pose the most challenge to implement as it will require dewatering of a highly-contaminated volume of material.

Alternatives CP-2 (Excavation/On-site Disposal Cianci Property), and CP-3 (Excavation/Off-site Disposal Cianci Property) would also require compliance with federal and state wetland and flood plain requirements, but this is not expected to limit the Implementability of these alternatives.

Overburden Aquifer: The no-action alternatives, ONOGU-1 (No Action Overburden NAPL Area) and OGW-1 (No Action Overburden Groundwater), are technically and administratively implementable.

Other than ONOGU-1, ONOGU-2 (Hydraulic Displacement/MNA) and ONOGU-3 (Hydraulic Displacement/Enhanced Bioremediation) would be the simplest to construct and operate. The initial construction requirements for alternative ONOGU-4 (Hydraulic Displacement/Chemical Oxidation/MNA) would be similar, although the chemical oxidation component would require additional infrastructure for mixing and injecting oxidant into the subsurface. Alternative ONOGU-6 (Excavation/Off-site Disposal) would be significantly more complex because of the need to dewater the aquifer and control particulate and volatile emissions during the excavation. Alternative ONOGU-5 (Thermal Treatment/MNA) requires a complex infrastructure and engineering to ensure the successful control of groundwater migration, and, the capture and on-site treatment of recovered solvent vapors making this alternative the most difficult to implement.

Alternative OGW-2 (Institutional Controls/MNA) and OGW-3 (Hydraulic Containment/MNA) are both easily implementable, and, technically and administratively feasible.

Bedrock Aquifer: All the alternatives for the Bedrock NAPL Area (NBGU-1 and NBGU-2) and Bedrock Groundwater (BGW-1 thru BGW-3) are technically and administratively implementable. The institutional controls required under Alternatives NBGU-2 (Institutional Controls/MNA), BGW-2 (Institutional Controls/MNA), and BGW-3 (Hydraulic Containment/MNA) may present minor administrative implementability issues. The groundwater containment and treatment system required by Alternative BGW-3 makes it slightly more difficult to implement BGW-2.

Cost

Soil/Wetland Soil: Alternatives OAR-1 (No Action Operations Area/Railroad) and CP-1 (No Action Cianci Property) have no capital costs associated with them and the costs associated with required five-year reviews are low. Alternatives OAR-2 (Cap Operations Area/Railroad) at $1,060,000, CP-2 (Excavation/On-site Disposal Cianci Property) at $310,000, and CP-3 (Excavation/Off-site Disposal Cianci Property) at $730,000 have relatively moderate costs. Alternative OAR-3 (Excavation/Off-site Disposal Operations Area/Railroad) has a relatively high cost at $13,230,000.

Overburden Aquifer: There are no capital costs associated with the no-action alternatives ONOGU-1 (Overburden NAPL Area) and OGW-1 (Overburden Groundwater). The cost of the five-year reviews has been included in the OGW alternatives.

The cost of treatment in the Overburden NAPL Area with hydraulic displacement and either MNA (ONOGU-2) or enhanced bioremediation (ONOGU-3) are at the lower end of the range at $6,190,000 and $9,640,000, respectively. Alternatives ONOGU-4 (Hydraulic Displacement/Chemical Oxidation/MNA) and ONOGU-5 (Thermal Treatment/MNA) are in the middle of the range at $20,130,000 and $17,660,000, respectively. The most expensive alternative to implement is ONOGU-6 (Excavation/Off-site Disposal) at $39,970,000. Because chemical oxidation is sensitive to mass estimates (i.e., more NAPL requires more oxidant), the cost of implementation of ONOGU-4 has the greatest potential to be an underestimate.

The cost of implementing institutional controls across the extent of the groundwater plume and monitoring the natural degradation (OGW-2) in the overburden is $2,590,000. Adding hydraulic containment (OGW-3) increases the cost to $9,570,000.

Bedrock Aquifer: There are no capital costs associated with the no-action alternatives NBGU-1 (Bedrock NAPL Area) and BGW-1 (Bedrock Groundwater).

Because the contaminated bedrock aquifer sits below the contaminated overburden aquifer, there is some overlap in costs. The costs associated with implementation of the institutional controls and hydraulic containment of the bedrock aquifer are included in the OGW alternatives. The incremental cost of conducting MNA in the portion of the bedrock plume which extends farther than the overburden plume under alternatives BGW-2 (Institutional Controls/MNA) and BGW-3 (Hydraulic Containment/MNA) is $660,000. MNA in the Bedrock NAPL Area is included in the $660,000, so there are no additional costs associated with alternative NBGU-2 (Institutional Controls/MNA Bedrock NAPL Area).

State Acceptance

State acceptance will be evaluated based on comments received during the comment period.

Community Acceptance

Community acceptance will be evaluated based on comment received. During the 30-day formal comment period, EPA will accept written comments and hold a public hearing to accept formal verbal comments.

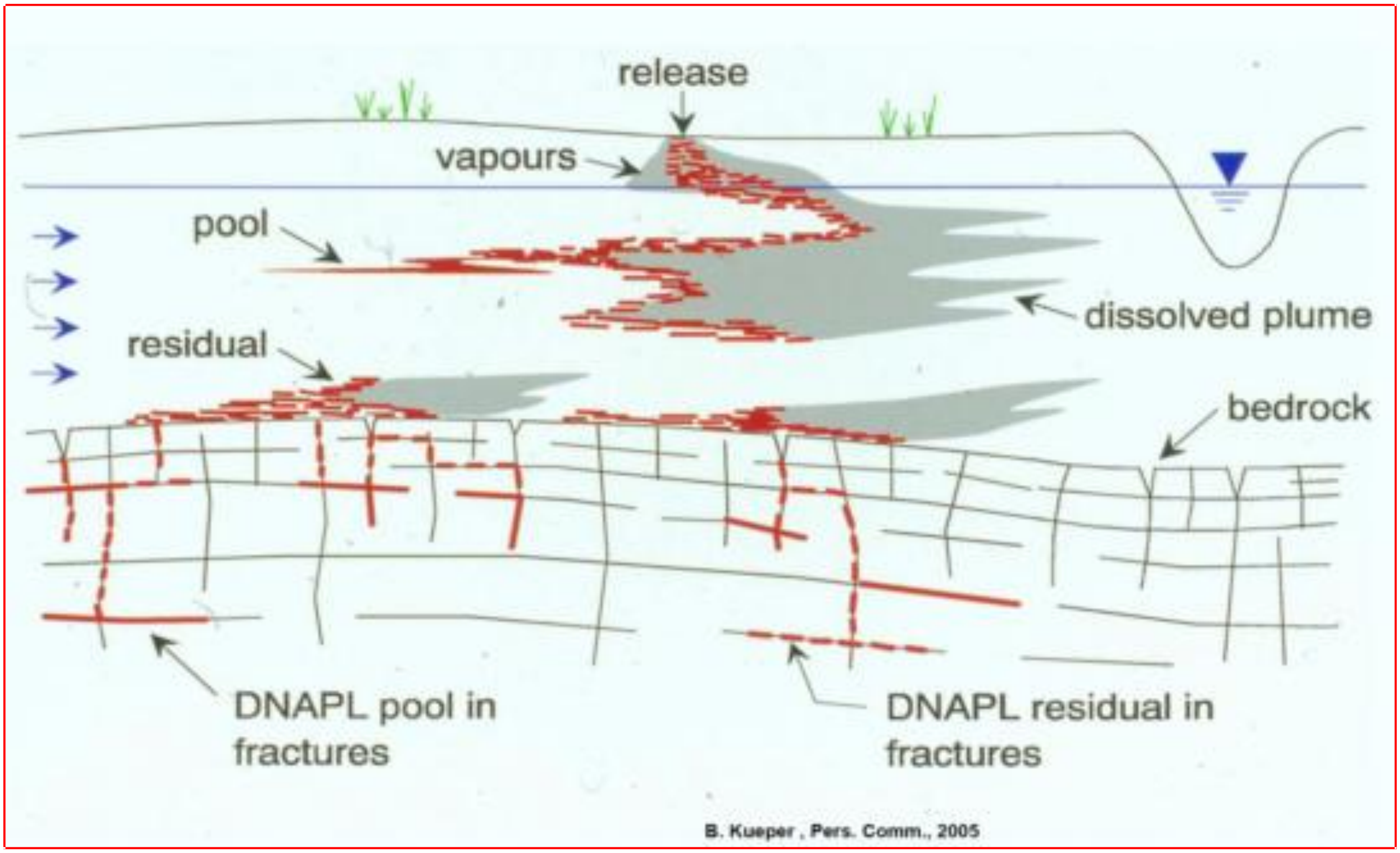
SUMMARY OF EVALUATION OF ALTERNATIVES

Capping the contaminated soil in the Operations Area and along the railroad, in conjunction with deed restrictions and long-term maintenance, offers the same overall protection of human health and the environment as excavation, at a fraction of the cost, and with fewer short-term impacts to the on-site workers and the community. The volume of contaminated soil and wetland soil to be excavated from the Cianci Property is relatively small, and placing it under the cap is less than half the cost of shipping it off site for disposal.

In-situ thermal treatment with MNA was selected for treating the overburden aquifer because it has the potential to remove the greatest amount of waste oil and solvent in the shortest period of time, at a comparatively moderate cost. In-situ thermal is a complex technology to design and run, and will require careful planning, engineering and monitoring to minimize any short-term impacts to on-site workers and the community during implementation.

Institutional controls and MNA was selected for the waste oil and solvent in the fractures in the bedrock because it offers more overall protection of human health and the environment than the no-action alternative.

Finally, the hydraulic containment component offers greater long-term effectiveness for the overburden and bedrock groundwater than institutional controls and MNA alone because it prevents the spread of groundwater with contaminants that exceed federal drinking water standards.



This schematic illustrates the many forms contamination can take in the overburden and bedrock aquifer at the SRSNE Site.

What are in situ thermal treatment methods?

In situ thermal treatment methods, in general, are ways to move or mobilize harmful chemicals through soil and groundwater by heating them. The heated chemicals move through the soil and groundwater toward underground wells where they are collected and piped to the ground surface. There the chemicals can be treated above ground by one of the many cleanup methods available.

How do they work?

All thermal methods work by heating polluted soil and groundwater. The heat helps push chemicals through the soil toward collection wells. The heat also can destroy or evaporate certain types of chemicals. When they evaporate, the chemicals change into gases, which move more easily through the soil. Collection wells capture the harmful chemicals and gases and pipe them to the ground surface for cleanup. A cover over the ground helps to prevent gases from escaping. Thermal methods can be particularly useful for chemicals called non-aqueous phase liquids or NAPLs, which do not dissolve easily in groundwater. As a result, they can be a source of groundwater pollution for a long time without proper treatment.

Why use in situ thermal treatment?

Thermal methods speed the cleanup of many types of chemicals in the ground. Faster cleanups can mean lower cleanup costs. Depending on the number of wells needed, thermal methods can be expensive. However, they are some of the few methods that can help clean up NAPL in place. This avoids the expense of digging up the soil for disposal or cleanup. Thermal methods can work in some soils (such as clays) where other cleanup methods do not perform well. They also offer a way of reaching pollution deep in the ground where it would be difficult or costly to dig. Thermal methods are being used at several dozen sites across the country, many of which are Superfund sites.

Use This Space to Write Your Comments or to be added to the mailing list

EPA encourages you to provide your written comments and ideas about the cleanup options under consideration for addressing the contamination at the Solvents Recovery Service of New England, Inc. Superfund Site. You can use the form below to send written comments, or submit them via the internet. If you have questions about how to comment, please call **Jim Murphy of EPA's Community Affairs Office at 617-918-1028 or toll free at 1-888-372-7341, extension 81028.** Submit written comments, which must be postmarked (in the case of U.S. Mail) or received (in the case of E-mail) no later than **July 8, 2005**, to:

Karen Lumino
Remedial Project Manager
EPA New England
1 Congress Street
Suite 1100 (HBT)
Boston, MA 02114 - 2023
E-mail: lumino.karen@epa.gov

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(Attach sheets as needed)

Comment Submitted by: _______________________________

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Mailing list additions, deletions or changes

If you did not receive this through the mail and would like to

- ❒ be added to the site mailing list
- ❒ note a change of address
- ❒ be deleted from the mailing list

Name : _______________________________
Address: _______________________________
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Please check the appropriate box and fill in the correct address information above. Send to Karen Lumino at above postal or e-mail address.

United States
Environmental Protection
Agency New England

One Congress Street Suite 1100 (HBT)
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Proposed Cleanup Plan for Solvents Recovery Service of New England, Inc. Superfund Site

Information Meeting:	**Wednesday, June 8, 2005**	**6:30 p.m.**	**Southington Public Library**	**255 Main Street**
Public Hearing:	**Thursday, June 30, 2005**	**6:30 p.m.**	**Southington Town Hall**	**75 Main Street**